

60,246-217; 10,688US

**IN THE CLAIMS**

1. (Currently Amended) An air purification system comprising:  
a substrate; and  
a photocatalytic coating applied on said substrate;  
a microwave energy source operative to emit microwaves having a predetermined frequency for desorbing water vapor absorbed on said photocatalytic coating; and  
a light source to activate said photocatalytic coating; and  
a porous screen defining an enclosure at least partially surrounding said microwave energy source and said substrate, said enclosure including porous screens for containing the microwaves in the enclosure, said substrate and said photocatalytic coating being located within said enclosure and said light source being located completely outside of said enclosure, wherein said porous screens are located between said light source and said substrate.
- 2.-4. (Cancelled)
5. (Currently Amended) The air purification system as recited in claim 4-1 wherein said photocatalytic coating is titanium dioxide.
6. (Currently Amended) The air purification system as recited in claim 4-1 wherein said photocatalytic coating is one of  $\text{Fe}_2\text{O}_3$ ,  $\text{ZnO}$ ,  $\text{V}_2\text{O}_5$ ,  $\text{SnO}_2$ , and  $\text{FeTiO}_3$ .
7. (Currently Amended) The air purification system as recited in claim 4-1 wherein said photocatalytic coating includes a metal oxide loaded on a photocatalytic material.
8. (Previously Presented) The air purification system as recited in claim 7 wherein said metal oxide is one of  $\text{WO}_3$ ,  $\text{ZnO}$ ,  $\text{CdS}$ ,  $\text{SrTiO}_3$ ,  $\text{Fe}_2\text{O}_3$ ,  $\text{V}_2\text{O}_5$ ,  $\text{SnO}_2$ ,  $\text{FeTiO}_3$ ,  $\text{PbO}$ ,  $\text{Co}_3\text{O}_4$ ,  $\text{NiO}$ ,  $\text{CeO}_2$ ,  $\text{CuO}$ ,  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{MnO}_2$ ,  $\text{Cr}_2\text{O}_3$ , and  $\text{ZrO}_2$ .

60,246-217; 10,688US

9.-11. (Cancelled)

12. (Currently Amended) The air purification system as recited in claim 9-1 wherein said light source is an ultraviolet light source.

13. (Currently Amended) The air purification system as recited in claim 9-1 wherein said light source is an ozone generating lamp.

14.-15. (Cancelled)

16. (Currently Amended) The air purification system as recited in claim 9-1 wherein light from said light source does not couple with said desired wavelength of energy.

17. (Original) The air purification system as recited in claim 1 wherein said substrate is an array of voids separated by a solid.

18. (Original) The air purification system as recited in claim 1 wherein said air purification system operates at room temperature.

19.-20. (Cancelled)

21. (Previously Presented) The air purification system as cited in claim 1 wherein said predetermined frequency is 17 GHz at 20°C.

22. (Previously Presented) The air purification system as cited in claim 1 wherein said predetermined frequency is 38 GHz at 50°C.

23.-29. (Cancelled)

60,246-217; 10,688US

30. (Previously Presented) The air purification system as recited in claim 1, wherein said porous screens comprise wire screens.

31. (Previously Presented) The air purification system as recited in claim 1, wherein said porous screens comprise openings that are smaller than a wavelength of the emitted microwaves.